

Notice of Allowability**Application No.**

10/692,350

Applicant(s)

CUNNINGHAM ET AL.

Examiner

Cam Y T. Truong

Art Unit

2169

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 8/12/2008.
2. ☒ The allowed claim(s) is/are 2,3,5-7,9-14 and 25-27.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
(b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Cam Y Truong
Primary Examiner
Art Unit: 2169

DETAILED ACTION

1. Claims 2-3, 5-7, 9-14, 25-27 are pending in this Office Action.

EXAMINER'S AMENDMENT

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with 8/28/2008 on Kenneth R. Eiferman.

In the specification: please replace the paragraph 0050 with the below paragraph.

[0050] As known and understood by those of skill in the art, a directory (that is, a directory of folders) is a tree-based hierarchical structure wherein files are grouped based on location in the folders which comprise the nodes of the tree structure. For example, as illustrated in Figure 3, a DOS-based file system base folder (or "root directory") 302 may comprise a plurality of folders 304, each of which may further comprise additional folders (as "subfolders" of that particular folder) 306, and each of these may also comprise additional folders 308 *ad infinitum*. Each of these folders may have one or more files 310 although, at the operating system level, the individual files in a folder have nothing in common other than their location in the tree hierarchy. Not surprisingly, this approach of organizing files into folder hierarchies indirectly reflects the physical organization of typical storage medium used to store these files. The storage medium includes hard disks, floppy disks, CD-ROMs.

In the claims: Please replace claims 3, 10, 25-27 with amended claims 3, 10, 25-27.

25. (Currently Amended) A computer system for processing a query, the computer system comprising:

a processor; a memory;

a data store comprising a table of documents and associated pre-computed values, the pre-computed values comprising information to discern objects based on type pursuant to a hierarchical search, each document having an associated document type in a hierarchy of document types, the document type associated with a document being used to compute a pre-computed value, wherein the pre-computed value is generated by concatenating type values of the document types along a path from a root document type to the document type associated with the document, and wherein the pre-computed value is compressed by separating the concatenated type values by a reserved separator byte; and

a document retrieval system that accesses the table in the data store to determine, for each document, if the pre-computed value associated with said each document satisfies the query, generates query results comprising the pre-computed value that satisfies the query, wherein the document retrieval system generates an estimate of selectivity of the query at least in part by creating a histogram over the pre-computed values, the histogram having a plurality of elements representing document types in the hierarchy of document types, each element associated with a quantity of documents of the document type represented by said each element,

encoding the query to describe one or more documents to retrieve based on an encoded query type,

for each element of the histogram, determining whether the encoded query type is a prefix of the document type represented by said each element of the histogram,

for said each element of the histogram which the encoded query type is determined to be a prefix of the document type represented by said each element of the histogram, adding an associated quantity to a sum of matching elements,

for each element of the histogram which the encoded query type is determined not to be a prefix of the document type, adding the associated quantity to a sum of non-matching elements

generating the estimate of the selectivity of the query as a function of the sums of matching elements and non-matching elements.

26. (Currently amended) A computer-readable storage medium storing computer-executable instructions that executed, cause a computer system to process a query by:

accessing a data store comprising a table of documents and associated pre-computed values, the associated pre-computed values comprising information used to discern objects based on type pursuant to a hierarchical search, each document in the table of documents having an associated document type in a hierarchy of document

types, the associated document type being used to compute a pre-computed value associated with said each document, wherein the pre-computed value is generated by concatenating type values of the document types along a path from a root document type to the document type associated with the document, and wherein the pre-computed value is compressed by separating the concatenated type values by a reserved separator byte;

determining, for each document, if the pre-computed value associated with said each document satisfies the query, generating query results comprising the pre-computed value that satisfies the query;

generating an estimate of selectivity of the query at least in part by creating a histogram over the pre-computed values, the histogram having a plurality of elements representing document types in the hierarchy of document types;

encoding the query to describe one or more documents to retrieve based on an encoded query type for each element associated with a quantity of documents of the document type represented by said each element,

for each element of the histogram, determining whether the encoded query type is a prefix of the document type represented by said each element of the histogram,

for said each element of the histogram which the encoded query type is determined to be a prefix of the document type represented by said each element of the histogram, adding an associated quantity to a sum of matching elements;

for each element of the histogram which the encoded query type is determined not to be a prefix of the document type, adding the associated quantity to a sum of non-matching elements; and

generating the estimate of the selectivity of the query as a function of the sums of matching elements and non-matching elements.

27. (Currently amended) A computer implemented method for processing a query, the method comprising:

accessing a data store comprising a table of documents and associated pre-computed values, the associated pre-computed values comprising information used to discern objects based on type pursuant to a hierarchical search, each document in the table of documents having an associated document type in a hierarchy of document types, the associated document type being used to compute a pre-computed value associated with said each document, wherein the pre-computed value is generated by concatenating type values of the document types along a path from a root document type to the document type associated with the document, and wherein the pre-computed value is compressed by separating the concatenated type values by a reserved separator byte;

determining, for each document, if the pre-computed value associated with said each document satisfies the query, generating query results comprising the pre-computed value that satisfies the query;

generating an estimate of selectivity of the query at least in part by creating a histogram over the pre-computed values, the histogram having a plurality of elements representing document types in the hierarchy of document types;

encoding the query to describe one or more documents to retrieve based on an encoded query type for each element associated with a quantity of documents of the document type represented by said each element,

for each element of the histogram, determining whether the encoded query type is a prefix of the document type represented by said each element of the histogram,

for said each element of the histogram which the encoded query type is determined to be a prefix of the document type represented by said each element of the histogram, adding an associated quantity to a sum of matching elements;

for each element of the histogram which the encoded query type is determined not to be a prefix of the document type, adding the associated quantity to a sum of non-matching elements; and

generating the estimate of the selectivity of the query as a function of the sums of matching elements and non-matching elements.

3. (Currently amended) The computer-readable storage medium of claim 26, wherein a document type is a subtype of another document type.

10. (Currently amended) The computer system of claim 26, wherein a document type is a subtype of another document type.

Allowable Subject Matter

3. Claims 2-3, 5-7, 9-14, 25-27 are allowed.

The prior art of record, alone or in combination, does not teach or fairly suggest the combination of steps as recited in independent claim 1 (system), claim 2 (computer readable medium) and 28 (method) wherein "determining, for each document, if the pre-computed value associated with said each document satisfies the query and generating query results comprising the pre-computed value that satisfies the query; generating an estimate of the selectivity of the query at least in part by creating a histogram over the pre-computed values, the histogram having a plurality of elements representing document types in the hierarchy of document types, for each element associated with a quantity of documents of the document type represented by said each element, encoding the query to describe one or more documents to retrieve based on an encoded query type, for each element of the histogram, determining whether the encoded query type is a prefix of the document type represented by said each element of the histogram, for said each element of the histogram which the encoded query type is determined to be a prefix of the document type represented by the element of the histogram, adding an associated quantity to a sum of matching elements, for said each element of the histogram which the encoded query type is determined not to be a prefix of the document type, adding the associated quantity to a sum of non-matching elements; and generating the estimate of the selectivity of the query as a function of the sums of matching elements and non-matching elements, wherein the pre-computed value is generated by concatenating respective type values of the document types

along a path from a root document type to the document type associated with the document , and wherein the pre-computed value is compressed by separating the concatenated type values by a reserved separator byte".

The dependent claims, bring definite, further limiting, and fully enabled by the specification are also allowed.

Contact Information

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cam Y T. Truong whose telephone number is (571) 272-4042. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on (571) 272-4107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cam Y Truong/
Primary Examiner, Art Unit 2169